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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,591	02/23/2004	Charles Black	YOR920010225US2	9561
47930 7590 10/07/2008 CONNOLLY BOVE LODGE & HUTZ LLP (FOR IBM YORKTOWN) P.O. BOX 2207 WILMINGTON, DE 19899-2207				
EXAMINER				
GOODWIN, DAVID J				
ART UNIT		PAPER NUMBER		
2818				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/784,591

**Applicant(s)**

BLACK ET AL.

**Examiner**

DAVID GOODWIN

**Art Unit**

2818

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 20, 24, 35, 37, 50, 51 and 53-55 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 20, 24, 35, 37, 50, 51 and 53-55 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 20, 24, 35, 50, and 51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 20 recites "in a range of about 50% to about 100%."
4. Claim 24 depends on claim 20.
5. Claim 35 recites "in a range of about 25% to about 75%."
6. Claim 50 recites "in a range of about 50% to about 60%."
7. Claim 51 recites "in a range of about 90% to about 100%."
8. The claims recite the limitation the film comprises nanoparticles in a range between a first percentage and a second percentage, "percentage of said film." However the claims do not indicate what percentage refers to. For example is 50% of the volume of the film composed of nanoparticles or 50% of the mass of the film
9. Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. Claim 35 states that "a percentage of the film comprising nanoparticles is in a range of about 25% to about 75%."

11. It is unclear whether the applicant intended this range to narrow the described range of claim 20. In which case claim 35 fails to further limit claim 20. 37 CFR 1.75(c) MPEP 608.01(n).

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 53 is rejected under 35 U.S.C. 102(b) as being anticipated by Chivukula (US 6,066,581).
2. Regarding claim 53.
3. Chivukula teaches a dielectric layer. Said layer is lead zirconate titanate and has a dielectric constant greater than 10 (column 13 lines 15-25). Said layer comprises particles having a diameter between 10 and 15 nm and a uniform size (column 15 lines 1-10). Particles having a uniform size would have a standard deviation of 0%. As the surfactant is removed from the layer, said material does not form part of the layer.
4. Note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not

patentable as a product, whether claimed in "product by process" claims or not. As stated in *Thorpe*,

- a. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*. 411 F.2d 1345, 1348, 162 USPQ 145, 147, (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir 1935).

Note that Applicant bears the burden of proof in such cases as the above case law makes clear.

1. Claims 20, 24, 35, 37, 50, 51, 53, 54, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leung (US 2002/0137260) in view of Matijevic (US 5,900,223).
2. Regarding claim 37
3. Leung teaches a dielectric layer. Said dielectric layer consists of nanoparticles have a 2nm diameter and having a monodisperse size distribution, which is less than 5% standard deviation (paragraph 0021). The nanoparticles may be coated with a surfactant (paragraph 0021).
4. Leung does not teach the dielectric constant of the material.
5. Matijevic teaches barium titanate nanoparticles (column 12 lines 30-45). Barium titanate has a dielectric constant higher than 10.
6. It would have been obvious to one of ordinary skill in the art to use barium titanate nanoparticles in order to make advanced superior products which have

nanoparticles having good sinterability, dense packing, fine grained structure, and a high dielectric constant.

7. Note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in *Thorpe*,

a. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*. 411 F.2d 1345, 1348, 162 USPQ 145, 147, (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir 1935).

Note that Applicant bears the burden of proof in such cases as the above case law makes clear.

8.

9. Regarding claim 50.

10. Differences in density will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such density are critical. "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller*, 220 F.2d 454,456,105 USPQ 233, 235 (CCPA 1955).

Since the applicant has not established the criticality (see next paragraph) of the density, and this density has been used in similar devices in the art (see, e.g., Matijavic column 7 lines 40-50) it would have been obvious to one of ordinary skill in the art to use these values in the device.

#### CRITICALITY

The specification contains no disclosure of either the critical nature of the claimed thickness or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

11. Regarding claim 51.
12. Differences in density will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such density are critical. "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller*, 220 F.2d 454,456,105 USPQ 233, 235 (CCPA 1955).

Since the applicant has not established the criticality (see next paragraph) of the density, and this density has been used in similar devices in the art (see, e.g., Matijavic column 7 lines 40-50) it would have been obvious to one of ordinary skill in the art to use these values in the device.

#### CRITICALITY

The specification contains no disclosure of either the critical nature of the claimed thickness or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

13. Regarding claim 20.

14. Differences in density will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such density are critical. "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller*, 220 F.2d 454,456,105 USPQ 233, 235 (CCPA 1955).

Since the applicant has not established the criticality (see next paragraph) of the density, and this density has been used in similar devices in the art (see, e.g., Matijavic column 7 lines 40-50) it would have been obvious to one of ordinary skill in the art to use these values in the device.

15. Regarding claim 35

16. Differences in density will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such density are critical. "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller*, 220 F.2d 454,456,105 USPQ 233, 235 (CCPA 1955).

Since the applicant has not established the criticality (see next paragraph) of the density, and this density has been used in similar devices in the art (see, e.g., Matijavic column 7 lines 40-50) it would have been obvious to one of ordinary skill in the art to use these values in the device.

#### CRITICALITY

17. The specification contains no disclosure of either the critical nature of the claimed thickness or any unexpected results arising therefrom. Where patentability is said to be



based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

18. Regarding claim 53.

19. Leung teaches that the surfactant is not added (paragraph 0021).

20. Regarding claim 54.

1. In an embodiment where the functional groups are removed from the surface of the nanoparticle note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in *Thorpe*,

a. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*. 411 F.2d 1345, 1348, 162 USPQ 145, 147, (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir 1935).

21. Note that Applicant bears the burden of proof in such cases as the above case law makes clear.

22. Regarding claim 55.

23. Leung teaches that the solvent is removed (paragraph 0023).

2. Note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in *Thorpe*,

b. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147, (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir 1935).

Note that Applicant bears the burden of proof in such cases as the above case law makes clear.

24. Regarding claim 24

25. Matijev teaches that the particles are barium titanate.

26. It would have been obvious to one of ordinary skill in the art to use barium titanate nanoparticles in order to make advanced superior products which have nanoparticles having good sinterability, dense packing, fine grained structure, and a high dielectric constant.

27. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leung (US 2002/0137260) in view of Matijev (US 5,900,223) as applied to claim 37 and further in view of Yokouchi (US 5,143,637).
28. Regarding claim 54
29. Leung in view of Matijev teaches elements of the claimed invention above.
30. Leung in view of Matijev does not teach the composition of the surfactant.
31. Yokouchi teaches a particle surfactant comprising a carboxyl group (column 5 lines 25-35).
32. It would have been obvious to one of ordinary skill in the art to coat the particles with carbyl groups in order to increase the dispersion of the particles.
- 5.

### ***Response to Arguments***

12. The applicant argues that the prior art does not teach that the particles are coated with surfactant.
13. The applicant argues that the prior art does not teach that the relative dielectric constant is greater than 10.
14. In response to applicant's arguments, the recitation the dielectric constant has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190

USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

15. Further the dielectric constant is a property of the material used. As Matijev teaches that the particles are barium titanate and barium titanate has a relative dielectric constant greater than 10, Leung teaches a layer having a relative dielectric constant greater than 10.

16. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

17. The applicant will note that Leung teaches that the particles may be coated with surfactant (paragraph 21). Leung states that Additional additives such as surfactants or binders may also be present in the dispersion. A particle immersed in a solution comprising surfactant will be coated with surfactant.

18. Further, as Leung is silent as to what the surfactant is it would be obvious tone of ordinary skill in the art to look to similar art to discern what surfactants may be used to coat particles.

19. The applicant argues that the process is a factor in the outcome but fails to indicate how

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID GOODWIN whose telephone number is (571)272-8451. The examiner can normally be reached on Monday through Friday, 9:00am through 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571)272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJG

/Steven Loke/  
Supervisory Patent Examiner, Art Unit 2818